

**DRAFT Engineering Evaluation
Mark Feitchmeir Residence
Application No. 30677
Plant No. 24763**

BACKGROUND

Mark Feitchmeir Residence has applied for an Authority to Construct and/or Permit to Operate for the following:

S-1 Emergency Standby LPG Generator Set
Make: Kohler, Model: KG6208, Model Year: 2020
103 bhp, 0.85 MMBtu/hr abated by

A-1 NETT, Technologies TG Series Catalytic Converter

The sources above will be located at 17433 Arnold Drive, Sonoma, CA 95476.

The Mark Feitchmeir Residence is proposing to install an emergency standby generator in order to provide the facility with power in the event of a Public Safety Power Shutoff. The generator is intended for emergency use only. The new four stroke, rich burn emergency engine will fire on liquid propane gas (LPG). The engine will be equipped with a non-selective catalytic reducer (NSCR) that will control precursor organic compounds (POC), nitrogen oxides (NO_x), and carbon monoxide (CO).

The criteria pollutants are nitrogen oxides (NO_x), carbon monoxide (CO), precursor organic compounds (POC) from unburned diesel fuel, sulfur dioxide (SO₂), and particulate matter (PM). All of these pollutants are briefly discussed on the District's web site at www.baaqmd.gov.

EMISSIONS CALCULATIONS

The facility has submitted supporting documents for the proposed engine, which include manufacturer specifications and emissions data. The PM emission factor is determined using AP-42 Chapter 3.2-3. The following tables provide a summary of the engine information, which was provided by the applicant.

Table 1: Daily and Annual Emissions from Manufacturer Guaranteed Data for S-1

Pollutant	Emission Factor¹ (g/bhp-hr)	Max Daily Emissions (lb/day)	Annual Emissions (lb/yr)	Annual Emissions (tons/yr)
NO _x	0.25	1.4	2.8	0.001
POC	0.61	3.3	6.9	0.003
CO	1.36	7.4	1.36	0.008
PM ₁₀	0.04	0.2	0.4	0.000
PM _{2.5}	0.04	0.2	0.4	0.000
SO ₂	N/A ²	0.0	0.0	0.000

Basis:

- Annual emissions: Reliability-related activity 50 hours for S-1
- Max daily emissions: 24-hour operation
- 1 pound = 454 grams
- ¹Emission factors provided by manufacturers' documentation
- ²SO₂ emission factor from AP-42 Table 3.2-3, SO₂ = 5.88E-4 lb SO₂/MMBtu

TOXIC RISK SCREENING

The emission factors used to estimate toxic air contaminant (TAC) emissions from the emergency engine are based on emission factors from the Environmental Protection Agency's (EPA's) AP-42, Chapter 3.2, Table 3.2-3, *Uncontrolled Emission Factors for 4-Stroke Rich Burn Engines* and the California Air Toxics Emission Factor (CATEF) database. CATEF emission factors have been used as first preference, with AP-42 emission factors used when an emission factor for a given pollutant is not in the CATEF database. The manufacturer of NSCR system has proposed 95% and 94% abatement factors for NO_x and CO, respectively. The District has decided to apply a 50% abatement factor on organic emissions, including TACs, for spark ignited engines. A permit condition limit will be placed on POC emissions, measured as non-methane organic compound (NMOC), which will act as an equivalent emission limit for organic TACs. No toxic air contaminants exceed the trigger levels set out in Regulation 2, Rule 5. Therefore, a Health Risk Analysis is not required.

TAC	Emission Factor	Assumed Abatement Efficiency	Abated Emissions	Acute Trigger Level	HRA Trigger	Abated Emissions	Chronic Trigger Level	HRA Trigger	Source
	lbs/MMscf	%	lb/hr	lb/hr	YES/ -	lb/yr	lb/yr	YES/ -	
1,1,2,2-Tetrachloroethane	6.51E-02	50	1.07E-05	-	-	5.35E-04	1.40E+00	-	AP-42 Table 3.2-3
1,3-Butadiene	2.64E-01	50	4.34E-05	1.50E+00	-	2.17E-03	4.80E-01	-	CATEF
Acenaphthene	8.54E-03	50	1.41E-06	-	-	7.03E-05	-	-	CATEF
Acenaphthylene	4.08E-02	50	6.72E-06	-	-	3.36E-04	-	-	CATEF
Acetaldehyde	4.59E+00	50	7.56E-04	1.00E+00	-	3.78E-02	2.90E+01	-	CATEF
Acrolein	3.46E+00	50	5.69E-04	5.50E-03	-	2.85E-02	1.40E+01	-	CATEF
Anthracene	5.70E-03	50	9.37E-07	-	-	4.69E-05	-	-	CATEF
Benzene	2.58E+01	50	4.24E-03	6.00E-02	-	2.12E-01	2.90E+00	-	CATEF
Benzo(g,h,i)perylene	6.17E-04	50	1.02E-07	-	-	5.08E-06	-	-	CATEF
Butyr/isobutyraldehyde	1.25E-01	50	2.06E-05	-	-	1.03E-03	-	-	AP-42 Table 3.2-3
Ethane	1.81E+02	50	2.98E-02	-	-	1.49E+00	-	-	AP-42 Table 3.2-3
Ethylbenzene	3.62E-02	50	5.96E-06	-	-	2.98E-04	2.90E+00	-	CATEF
Fluoranthene	3.04E-03	50	5.00E-07	-	-	2.50E-05	-	-	CATEF
Fluorene	2.28E-02	50	3.75E-06	-	-	1.87E-04	-	-	CATEF
Formaldehyde	2.88E+01	50	4.73E-03	1.20E-01	-	2.36E-01	1.40E+01	-	CATEF
Methanol	7.87E+00	50	1.29E-03	6.20E+01	-	6.47E-02	1.50E+05	-	AP-42 Table 3.2-3

TAC	Emission Factor	Assumed Abatement Efficiency	Abated Emissions	Acute Trigger Level	HRA Trigger	Abated Emissions	Chronic Trigger Level	HRA Trigger	Source
	lbs/MMscf	%	lb/hr	lb/hr	YES/ -	lb/yr	lb/yr	YES/ -	
Methylene Chloride	1.06E-01	50	1.74E-05	3.10E+01	-	8.72E-04	8.20E+01	-	AP-42 Table 3.2-3
Naphthalene	2.18E-01	50	3.59E-05	-	-	1.80E-03	2.40E+00	-	CATEF
PAH	6.71E-04	50	1.10E-07	-	-	5.52E-06	3.30E-03	-	CATEF
Phenanthrene	2.23E-02	50	3.67E-06	-	-	1.83E-04	-	-	CATEF
Propylene	1.06E+02	50	1.74E-02	-	-	8.71E-01	1.20E+05	-	CATEF
Pyrene	6.65E-03	50	1.09E-06	-	-	5.47E-05	-	-	CATEF
Styrene	3.06E-02	50	5.03E-06	4.60E+01	-	2.52E-04	3.50E+04	-	AP-42 Table 3.2-3
Toluene	6.62E+00	50	1.09E-03	8.20E+01	-	5.44E-02	1.20E+04	-	CATEF
Xylene	1.86E-01	50	3.06E-05	4.90E+01	-	1.53E-03	2.70E+04	-	CATEF
Xylene (m,p)	1.14E+00	50	1.88E-04	4.90E+01	-	9.41E-03	2.70E+04	-	CATEF
Xylene (o)	5.59E-01	50	9.20E-05	4.90E+01	-	4.60E-03	2.70E+04	-	CATEF

PLANT CUMULATIVE EMISSION

The following tables summarize the cumulative increase in BACT pollutant emissions that will result from this application.

Table 3. Cumulative increase in tons/yr

Pollutant	Existing, tpy	New, tpy	Total, tpy
NOx	0.000	0.001	0.001
CO	0.000	0.008	0.008
PM10 and 2.5	0.000	0.000	0.000
SO ₂	0.000	0.000	0.000
POC	0.000	0.003	0.003

BEST AVAILABLE CONTROL TECHNOLOGY (BACT)

Pursuant to Regulation 2-2-301, BACT is required for a new source with emission increases that equal 10.0 lbs or greater of any BACT pollutant. The engine is not expected to exceed the BACT threshold for NOx, POC, CO, PM₁₀, or SO₂. Therefore, S-1 is not subject to the BACT standards mentioned below.

BACT for this source is presented in the current BAAQMD BACT/TBACT Workbook for IC Engine – Spark Ignition: Stationary Emergency, Natural Gas Fired Engine, Document #96.3.4, Revision 1. (as a closest substitute for LPG) dated 5/07/2003. The more restrictive BACT(1) standards are not applicable to this engine because it will be limited to operation as an emergency standby engine.

OFFSETS

Emission offset requirements for POC and NO_x are set out in Regulation 2, Rule 2, Section 302. POC and NO_x offsets are required for new or modified sources at a facility that emits or will be permitted to emit 10 tons per year or more of that pollutant. Offsets for POC and NO_x are not required for this application. This is a new facility with no existing emissions.

The offsets requirements for PM₁₀, PM_{2.5}, and SO_x are specified in Regulation 2, Rule 2, Section 303. Per Section 303, PM₁₀, PM_{2.5}, and SO_x emission offsets are required for any new or modified source that is a major facility for PM₁₀, PM_{2.5}, or SO_x emissions. This facility is not a major facility for PM₁₀, PM_{2.5}, and SO_x emissions. Therefore, offsets for PM₁₀, PM_{2.5}, and SO_x are not required for this application.

STATEMENT OF COMPLIANCE

The owner/operator is expected to comply with all applicable requirements. Key requirements are listed below:

**New Source Performance Standards (NSPS)
40 CFR Part 60 Subpart JJJJ**

According to §60.4230(a)(2)(ii), a rich-burn, LPG-fueled, emergency engine that commenced construction after January 1, 2009, where the engine power rating is greater than 25 hp is subject to the requirements of 40 CFR Part 60 Subpart JJJJ, *“Standards of Performance of Stationary Spark Ignition Internal Combustion Engines.”* The proposed rich-burn LPG emergency engine is greater than 25 hp. Therefore, the engine is subject to the requirements of this subpart. S-1 will comply with 40 CFR Part 60 Subpart JJJJ according to §60.4231(c) by meeting the Phase 1 emission standards applicable to class II engines shown in 40 CFR 90.103, which are:

HC+NO_x: 13.4 g/kw-hr
CO: 519 g/kw-hr

**National Emissions Standards for Hazardous Air Pollutants (NESHAP)
40 CFR Part 63 Subpart ZZZZ**

The emergency engine is not subject to the emission or operating limitations in 40 CFR 63, Subpart ZZZZ, NESHAPs for Stationary Reciprocating Internal Combustion Engines, because they are subject to Subpart JJJJ (See 40 CFR 63.6590(c)(1)). The engine complies with Subpart ZZZZ by meeting Subpart JJJJ requirements.

District Rules**Regulation 6, Rule 1**

Pursuant to Regulation 6-1-303 a person shall not emit, from any source, for a period or periods aggregating more than three minutes in any hour, a visible emission that is as dark or darker than No. 2 on the Ringelmann Chart, or of such opacity as to obscure an observer's view to an equivalent or greater degree, nor shall said emission, as perceived by an opacity sensing device in good working order, where such device is required by District Regulations, be equal to or

greater than 40% opacity. The emergency engine is expected to meet the requirements of Regulation 6-1-303.

Regulation 9, Rule 1

The engine is subject to the SO₂ limitations of Regulation 9-1-301 (Limitations on Ground Level Concentrations of Sulfur Dioxide), Regulation 9-1-302 (Limitations Sulfur Dioxide Emissions) and 9-1-304 (Burning of Solid and Liquid Sulfur Dioxide Fuel).

Pursuant to Regulation 9-1-301, the ground level concentrations of SO₂ shall not exceed 0.5 ppm continuously for 3 consecutive minutes or 0.25 ppm averaged over 60 consecutive minutes, or 0.05 ppm averaged over 24 hours. Pursuant to Regulation 9-1-302, a person shall not emit from any source, a gas stream containing SO₂ in excess of 300 ppm (dry). Lastly, pursuant to Regulation 9-1-304, a person shall not burn any liquid fuel having a sulfur content in excess of 0.5% by weight. S-1 is expected to comply with Regulation 9-1.

Regulation 9, Rule 8

This rule limits the emissions of NO_x and CO from stationary internal combustion engines with an output rated by the manufacturer at more than 50 brake horsepower. The engine is intended to operate at a specific site for more than one year and will be attached to a foundation at the site. The requirements of this rule apply. In addition, the engine will be used for emergency use and is defined as an emergency standby engine pursuant to Regulation 9-8-230.

According to Regulation 9-8-110.5, emergency standby engines are exempt from the requirements of Regulations 9-8-301 through 305, 9-8-501, and 9-8-503. However, emergency standby engines are subject to the requirements of Regulation 9-8-330. Pursuant to Regulation 9-8-330, the engine will be allowed to operate 50 hours per calendar year for reliability-related activities.

In accordance with Regulation 9-8-530, the engine shall be equipped with a non-resettable totalizing meter that measures hours of operation or fuel usage. Monthly records for the following shall be kept for at least 2 years and be made available to District staff upon request.

- Total hours of operation;
- Emergency hours of operation; and,
- The nature of the emergency condition for each emergency.

The engine is expected to meet the aforementioned requirements.

California Environmental Quality Act (CEQA)

Pursuant to Regulation 2-1-311, an application for a proposed new or modified source will be classified as ministerial and will accordingly be exempt from the CEQA requirement of Regulation 2-1-310 if the District's engineering evaluation and basis for approval or denial of the permit application for the project is limited to the criteria set forth in Regulation 2-1-428 and to the specific procedures, fixed standards, and objective measurements set forth in the District's Permit Handbook and BACT/TBACT Workbook. The evaluation was performed in accordance

with the criteria set forth in Chapter 2.3.2 of the Permit Handbook and is considered to be ministerial concerning air quality impacts.

Prevention of Significant Deterioration (PSD)

This application is not part of a PSD project as defined in Regulation 2-2.

California Health & Safety Code §42301.6 and Regulation 2-1-412

Pursuant to California Health & Safety Code §42301.6(a), prior to approving an application for a permit to construct or modification of a source, which is located within 1,000 feet from the outer boundary of a school site, the District shall prepare a public notice as detailed in §42301.6.

§42301.9(a) defines a “school” as any public or private school used for the purposes of the education of more than 12 children in kindergarten or any grades 1 to 12, inclusive, but does not include any private school in which education is primarily conducted in private homes.

Using the GreatSchools.org website and searching with Google Maps, it has been determined that the source will be located within 1,000 feet of the outer boundary of a K-12 school: Altamira Middle School, located at 17805 Arnold Dr, Sonoma, CA 95476. Therefore, the requirements of the California Health & Safety Code §42301.6 and Regulation 2-1-412 apply. The public comment period will begin on February 2, 2021 and will end on March 4, 2021.

CONDITIONS

Permit Condition 23113 for S-1

1. The owner or operator shall operate the stationary emergency standby engine only to mitigate emergency conditions or for reliability-related activities (maintenance and testing). Operating while mitigating emergency conditions and while emission testing to show compliance with this part is unlimited. Operating for reliability-related activities are limited to 50 hours per year.

[Basis: Regulation 9-8-330]

2. The Owner/Operator shall equip the emergency standby engine with: a non-resettable totalizing meter that measures hours of operation or fuel usage.

[Basis: Regulation 9-8-530]

3. The Owner/Operator shall not operate unless the liquid petroleum gas fired engine is abated with a Catalytic Converter.

[Basis: Cumulative Increase]

4. Records: The Owner/Operator shall maintain the following monthly records in a District-approved log for at least two years from the date of entry or 60 months from the date of entry for a Title V Facility. Log entries shall be retained on-site, either at a central location or at the engine's location, and made immediately available to the District staff upon request.

- a. Hours of operation (maintenance and testing).
- b. Hours of operation for emission testing.
- c. Hours of operation (emergency).
- d. For each emergency, the nature of the emergency condition.
- e. Fuel usage for engine.

[Basis: Regulation 9-8-530]

RECOMMENDATION

The District has reviewed the material contained in the permit application for the proposed project and has made a preliminary determination that the project is expected to comply with all applicable requirements of District, state, and federal air quality-related regulations. The preliminary recommendation is to issue an Authority to Construct/Permit to Operate for the equipment listed below. However, the proposed source will be located within 1,000 feet of a school, which triggers the public notification requirements of District Regulation 2-1-412. After the comments are received and reviewed, the District will make a final determination on the permit. The public comment period will begin on February 2, 2021 and will end on March 4, 2021.

I recommend that the District initiate a public notice and consider any comments received prior to taking any final action on issuance of an Authority to Construct/Permit to Operate for the following sources:

- S-1 Emergency Standby LPG Generator Set**
Make: Kohler, Model: KG6208, Model Year: 2020
103 bhp, 0.85 MMBtu/hr

By: _____
Ryan Atterbury
Air Quality Engineer

Date: _____